

Diseases can be spread to wildlife populations by domestic animals

by Elizabeth Jozwiak

There is always a concern about the potential transmission of diseases from wildlife populations to both humans and domestic animals. West Nile Virus (WNV) is one example of a disease spread by wild birds and mosquitoes that has been in the media spotlight in recent years. It is only recently that wildlife managers, conservationists, and biologists have focused their attention on the reverse pattern; the spread of contagious diseases from domestic animals into wildlife populations. Many of these wildlife diseases are viewed as “emerging” particularly as we introduce species around the globe and as our domestic plants and animals encroach on natural habitat.

Domestic animals that are allowed to roam or mingle with wildlife, such as dogs and cats can harbor diseases which can be devastating to rare species. For example, in 1985, the last remnant of the black-footed ferret population in North America was reduced from an estimated 58 individuals in 1985 to 16 individuals in 1986. This catastrophic decline in numbers was attributed partly to infection by canine distemper virus (CDV) and partly to losses during juvenile dispersal. CDV typically causes disease in domestic dogs. In Tanzania, CDV has caused the death of lions and other wild carnivores, and is believed to have been transmitted to wildlife by infected domestic dogs owned by local tribesmen.

Feline infectious peritonitis (FIP) and feline panleukopenia virus (FPV) are both contagious diseases of domestic cats. FIP has been diagnosed in jaguar, mountain lion, and lynx, and FPV (also known as feline distemper) has been found in the endangered Florida panther. A portion of the deaths in the declining California sea otter populations were attributed to *Toxoplasma gondii*, a domestic cat parasite. *Toxoplasma* cysts (which can be found in cat feces) were present in the contaminated sea water where sea otters were present.

Domestic animals have generally been selectively bred and have evolved under different conditions than their wild counterparts and thus many have become more or less susceptible to certain diseases or strains

of pathogens. Because of their population isolation, this is especially true for wildlife species that are specialized for more remote habitats (i.e. bighorn sheep and mountain goats). One classic example of how domestic livestock and wildlife have evolved differently and carry different diseases is the exchange of the *Pasteurella* spp. bacteria from domestic sheep (*Ovis aries*) to bighorn sheep (*Ovis canadensis*).

The *Pasteurella* species that has been linked to severe die-offs of wild bighorn sheep in all of the western United States is transmitted to bighorns through contact with domestic sheep and yet has no negative effect on the domestic sheep. Bighorn sheep populations in the San Juan Mountains of Utah experienced a 98% herd reduction over an 18-year period due to *Pasteurella* related die-offs.

There have also been concerns over the transmission of other types of pathogens such as scabies and assorted parasites from domestic sheep, cattle and horses to bighorn sheep and mountain goats. Recent increases in the use of non-traditional livestock such as: goats, llamas, alpacas, and camels, for recreational use in remote habitats has also prompted concern from wildlife biologists and outdoor recreation enthusiasts.

The introduction of domestic livestock or captive wildlife (elk, deer) and grazing practices in natural areas has allowed diseases to spill over into wild populations. Pioneers brought cattle with them as they came west and let them loose to forage on the open range. This open range was habitat for a great diversity of wildlife species and often the two could not help but interact.

The practice of open-range grazing by livestock on lands co-occupied by wildlife is still widely practiced today. While there are many mutually beneficial results of this practice, it has also led to some major problems. The primary concerns include the displacement of wildlife off of their traditional grazing lands, and the transmission of diseases between domestic animals and associated wildlife. For instance, a disease called brucellosis that causes pregnant animals to abort was probably co-introduced to America

with cattle. So the presence of the disease in bison of Yellowstone National Park is considered a potential threat to domesticated cattle grazing at the park's boundaries.

Chronic wasting disease (CWD) was first identified in captive deer in Colorado in 1967 and since has been found in wild and/or captive deer and elk in parts of at least seven other states (Montana, Wyoming, South Dakota, Kansas, Nebraska, Oklahoma and Wisconsin) and two Canadian provinces, (Alberta and Saskatchewan). Researchers speculate that CWD could have been transported long distances as a result of interstate shipment of infected animals.

Another mode of disease transmission is the introduction of animals to new geographic regions and the co-introduction of their pathogens. For example, avian malaria on Hawaii is thought to have caused the extinction of a number of native song bird species and was originally introduced with exotic, alien birds. Newcastle virus, a disease of domestic poultry has caused widespread deaths in nestling and juvenile pelagic birds, such as in double crested cormorant colonies. An epizootic of rabies in raccoons was started when people moved raccoons from a rabies-endemic area to the mid-Atlantic region, in an attempt to increase hunting stocks.

Wildlife populations on the Kenai NWR are also at risk of developing diseases from domestic animals and introduced species. In the early 1980s the Kenai Peninsula wolf population contracted an ectoparasite (the biting dog louse) probably from contact with free ranging or feral dogs. The parasite causes itching and hair loss, and reduces an animal's ability to stay warm in

winter. The parasite spread quickly through the population, and earlier attempts by the ADFG and USFWS to eradicate the lice by treating wolf packs with medication was unsuccessful. Coyotes also became infected with the biting dog louse, but in smaller numbers.

Blood samples from wolves, coyotes, and lynx collected by Refuge biologists since 1976 have shown that both CDV and CPV occur to some degree in the wolf population on the Refuge probably as a result of contact with domestic dogs. Exposure to CDV and/or CPV was first detected in wolves in 1979, and about 12% of the sampled wolf population was exposed to both viruses. Tests have also indicated that one lynx out of 54 sampled was exposed to CDV and also tested positive to FPV.

A solution to reduce disease transmission from domestic animals to wildlife populations will involve educating the residents of communities that live along the boundaries of the Refuge. Properly vaccinating pets, and preventing dogs, cats, rabbits, poultry and livestock from ranging freely are good approaches. Never allowing the transplant, or release of non-native game birds, such as chukar, quail and ring-necked pheasants off personal property will also help eliminate the spread of exotic diseases to Kenai Peninsula's native wildlife.

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